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ABSTRACT

School-bus handrails have had the same basic design for more than 30 years. However, students' recent propensity to wear oversized and baggy clothing increases the likelihood that clothing or accessories may become snagged on bus handrails. Children across the United States have been injured or killed when their clothing or accessories caught in their school bus's handrail or door as they exited. This brochure illustrates defective and corrected handrail designs, and outlines the responsibilities of the school bus driver, students, parents, and school administrators in addressing the problem. The brochure also explains how to conduct a handrail inspection with a standard half-inch hex nut tied to a thick, 36-inch-long cotton cord. Six figures are included. (LMI)

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NHTSA
People Saving People

A SCHOOL BUS HANDRAIL HANDBOOK

2

This Could Save Your Child's Life

A School Bus Handrail Handbook

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The Issue

Across the United States, children are being injured or killed when their clothing or accessories are caught in their school bus's handrail or door as they exit the school bus. As a result, they may fall and be violently dragged by the bus and run over by its rear wheels.

The most common piece of clothing that can be snagged on the handrail is a jacket with a drawstring at the waist. These drawstrings commonly have a large bobble or knot at the ends that can become lodged in the handrail. However, other articles of clothing such as scarves, long straps on backpacks, or dangling key chains can also be snagged on the handrail.

Handrail Mechanics

School bus handrails have had the same basic design for more than 30 years. However, with the current change in fashion toward oversized and baggy clothing, handrail designs have contributed to tragic and avoidable injuries and deaths. Typical handrail designs that have the potential for snagging are illustrated in Figures 1 and 2.

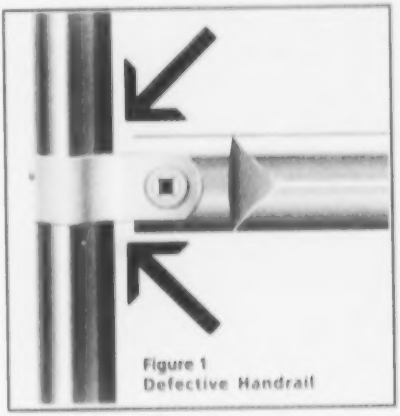

Figure 1
Defective Handrail

Figure 2
Defective Handrail

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School bus manufacturers have taken extraordinary and costly steps to remove snagging hazards from school bus entrances. More than 400,000 school buses have been recalled and manufacturers have absorbed the cost of the repairs. In most cases, a simple spacer can be added to the existing handrail eliminating the potential for snagging. In other cases, manufacturers have redesigned the handrail. Figures 3 and 4 illustrate handrails that have been modified.

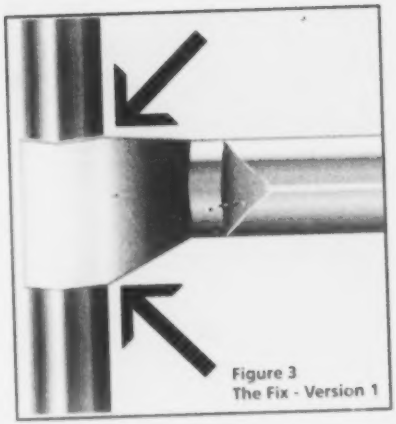

Figure 3
The Fix - Version 1

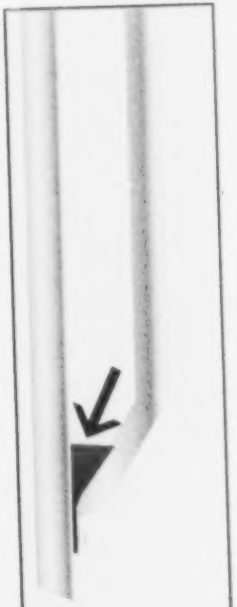

Figure 4
The Fix - Version 2

The School Bus Driver's Role

The school bus driver is a trained professional concerned with getting children to school and returning them home safely. Driving a school bus is a demanding task. There is a lot of activity in and around the bus. The bus driver must be aware of ever-changing traffic conditions, the children on the bus, and the children who enter and exit at each school bus stop. Compounding this already complex situation is the need for the driver to maintain the school bus schedule.

The major reason for injury and death due to handrail snagging incidents is the driver's failure to notice that the child's drawstring has become snagged. The driver should observe all children, especially those with long drawstrings, oversized or baggy clothing, or other items that may become snagged in handrails, as they exit. Additionally, to ensure safety at each stop, the driver should be certain that each child has completely exited the bus and cleared

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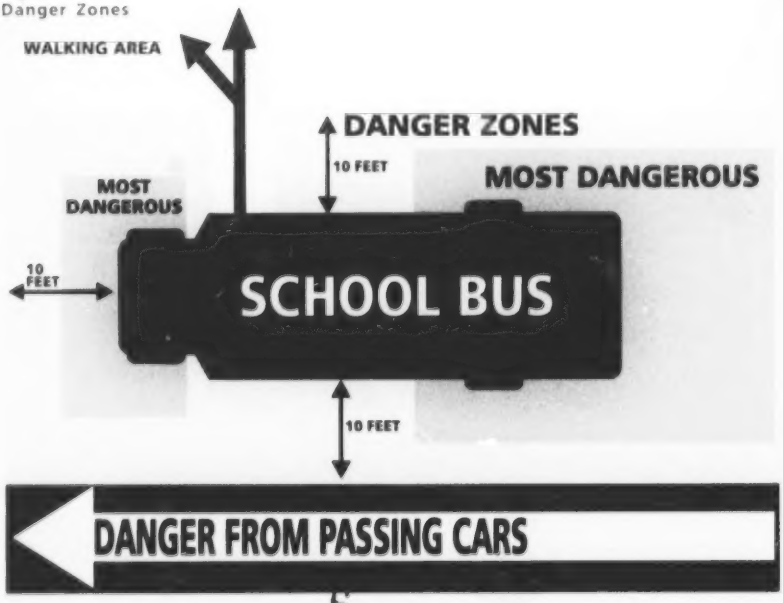
the danger zones before closing the door and moving the vehicle. The driver should secure the bus and check around and underneath the bus if there is a question of whether a child has moved safely away from the bus. Finally, the driver must be alert for warnings as the bus pulls away. In many of the snagging incidents that have occurred to date, someone inside or outside the bus attempted to warn the driver that a child was being dragged by the bus.

Children's and Parents' Responsibilities

Children and parents must also accept some responsibility for ensuring that a snagging incident does not occur. While oversized and baggy clothing may represent the latest fashion trend, try to avoid choosing any article that may become caught in a school bus handrail or door. The Consumer Product Safety Commission recommends that drawstrings be no more than three inches in length at the waist. Parents should caution children about attaching key rings and other items to their backpacks as these too may become caught on the handrail or door.

Figure 5
Danger Zones



While not directly related to snagging, children should also be warned to stay out of the school bus danger zones. (Figure 5). The danger zones are areas around the bus where it is difficult for the driver to see. Children should be taught not to pick up objects they drop near the bus. The driver may not see the child. If the child does drop something, the child should inform the bus driver and follow the driver's instructions.

Parents should check with the school principal, or the local school bus transportation director to determine if the school bus carrying their children has been recalled for a handrail problem and, if so, whether it has been repaired. Parents are encouraged to check with the school system when their child's safety is in question.

School Administrators Must Be Active

School administrators must also play an active role in taking steps to eliminate handrail snagging injuries and deaths. All school buses must be inspected to determine if potential snagging areas exist. Administrators should contact NHTSA's Auto Safety Hotline at 800-424-9393 to find out which buses have been recalled for this or other problems.

If a school bus with a defective handrail is found, the bus should be taken out of service immediately and kept from service until proper repairs have been made. All manufacturers' recalls should be given high priority and addressed quickly.

School officials should also design training curricula for school bus drivers, teachers, and parent organizations. Driver training should be implemented to reinforce safe loading and unloading practices. Teacher and parent organizations should be informed of the potential for snagging situations and their role in injury prevention.

The Handrail Inspection Tool and Procedure

The inspection tool (Figure 6) is inexpensive and the procedure for detecting potentially fatal handrail designs is quite simple. The inspection tool is a standard 1/2" hex nut measuring 3/4" across the flats. This nut is tied to 1/8"thick cotton cord measuring 36" in length with overhand knots. The drawstring should have a minimum length of 30" when tied to the nut and attached so that a pull of at least ten pounds does not separate the nut from or break the drawstring.

Steps to conduct a handrail inspection are:

- Stand on the ground outside of the bus
- Drop the inspection tool between the handrail and step well wall, simulating the typical way students exit the bus
- Draw the inspection tool through the handrail in a smooth, continuous slow motion
- Repeat this procedure several times (minimum of three times)

Note: It is important to drop the inspection tool over the handrail in such a way as to simulate a child exiting the bus. This is a ***drop and drag*** test. Do not create a snagging situation by placing the nut in an area that would not be exposed to a drawstring or other articles.

Inspection Results

- Take the bus out of service and repair it if the inspection tool catches or snags anywhere on the handrail.
- If the nut separates from the drawstring or the drawstring breaks, reassemble the tool and retest. If the inspection tool pulls freely without catching or snagging, the bus should not be rejected.

Figure 6
The Tool

Reminder

It is important to inspect all school buses including those that have been repaired. If you have questions, contact NHTSA's Auto Safety Hotline at the number listed below.

School buses are the safest way to transport children to and from school. By working together we can ensure that these vehicles' outstanding safety record will not diminish. If you have questions concerning school bus handrails or other school bus safety related issues, contact your local school district or state director of pupil transportation or call NHTSA's Auto Safety Hotline at 800-424-9393.

Notes

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